In the Claims

Amendments to the Claims:

1. (currently amended) A method of bonding a chip to a substrate, comprising the steps of:

providing a semiconductor chip having an exposed metal terminating pad thereover, and a separate substrate having a corresponding exposed metal bump thereover;

forming a conducting polymer plug over said exposed metal terminating pad;

forming a conforming interface layer over said conducting polymer plug; wherein said conforming interface layer is comprised of $Ni(CO)_4$;

aligning said conducting polymer plug of said semiconductor chip with said corresponding metal bump;

mating said conforming interface layer over said conducting polymer plug with said corresponding metal bump; and

thermally decomposing said conforming interface layer, adhering and permanently attaching said conducting polymer plug of said semiconductor chip with said corresponding metal bump of said separate substrate.

2. (original) The method of claim 1, wherein said conducting polymer plug is from about 1000 to 10,000Å thick.

3. (original) The method of claim 1, wherein said exposed metal terminating pad and said exposed metal bump are comprised of copper.

4. (original) The method of claim 1, wherein said conducting polymer plug is comprised of a material selected from the group consisting of doped polyacetylene, poly (para-phenylene vinylene) (PPV), and polyaniline.

5. (original) The method of claim 1, wherein said conducting polymer plug is a material doped to degeneracy.

Claim 6 (canceled)

7. (currently amended) A method of bonding a chip to a substrate, comprising the steps of:

providing a semiconductor chip having a metal terminating pad thereover, and a separate substrate having a corresponding exposed metal bump thereover;

forming a final passivation layer over said metal ~~bump~~ terminating pad;

forming an opening within said final passivation layer, exposing said metal terminating pad;

forming a conducting polymer plug within said final passivation layer opening and over said exposed metal terminating pad;

forming an interface layer over said conducting polymer plug and said final passivation layer;

removing the excess of said interface layer over said final passivation layer and not over said conducting polymer plug, forming conforming interface layer;

removing said passivation layer from said semiconductor chip;

aligning said conducting polymer plug of said semiconductor chip with said corresponding metal bump;

mating said conforming interface layer over said conducting polymer plug with said corresponding metal bump; and

thermally decomposing said conforming interface layer, adhering and permanently attaching said conducting polymer plug of said semiconductor chip with said corresponding metal bump of said separate substrate.

8. (original) The method of claim 7, wherein said conducting polymer plug is from about 1000 to 10,000Å thick.

9. (original) The method of claim 7, wherein said exposed metal terminating pad and said exposed metal bump are comprised of copper.

10. (original) The method of claim 7, wherein said conducting polymer plug is comprised of a material selected from the group consisting of doped polyacetylene, poly (para-phenylene vinylene) (PPV), and polyaniline.

11. (original) The method of claim 7, wherein said conducting polymer plug is doped to degeneracy.

12. (original) The method of claim 7 wherein said conforming interface layer is comprised of $Ni(CO)_4$.

13. (currently amended) A method of bonding a chip to a substrate, comprising the steps of:

providing a semiconductor chip having a copper terminating pad thereover, and a separate substrate having a corresponding exposed copper bump thereover;

forming a final passivation layer over said copper ~~bump~~ terminating pad;

forming an opening within said final passivation layer, exposing said copper terminating pad;

forming a conducting polymer plug within said final passivation layer opening and over said exposed copper terminating pad; said conducting poly plug being from about 1000 to 10,000Å thick;

forming an interface layer over said conducting polymer plug and said final passivation layer;

removing the excess of said interface layer over said final passivation layer and not over said conducting polymer plug, forming conforming interface layer;

removing said passivation layer from said semiconductor chip;

aligning said conducting polymer plug of said semiconductor chip with said corresponding copper bump;

mating said conforming interface layer over said conducting polymer plug with said corresponding copper bump; and

thermally decomposing said conforming interface layer, adhering and permanently attaching said conducting polymer plug of said semiconductor chip with said corresponding copper bump of said separate substrate.

14. (original) The method of claim 13, wherein said conducting polymer plug is from about 3000 to 6000Å thick.

15. (original) The method of claim 13, wherein said conducting polymer plug is comprised of a material selected from the group consisting of doped polyacetylene, poly (para-phenylene vinylene) (PPV), and polyaniline.

16. (original) The method of claim 13, wherein said conducting polymer plug is doped to degeneracy.

17. (original) The method of claim 13 wherein said conforming interface layer is comprised of $Ni(CO)_4$.

Claims 18 to 30 (canceled)